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- an average molecular mass of between 500 000 and 3 000 000 or a number of atoms along the main skeleton of between 7 000 and 90 000,
- a fraction by mass of segments with LCST of between 2.5% and 15%, and
- an average molecular mass of segments with LCST of between 4 000 and 30 000 or an average number of atoms along a segment with LCST of between 60 and 600.

--51. (new) The medium according to Claim 32, which transits from a viscosity  $V_1$  of between 100 and 10 000  $\text{mPa}\cdot\text{m}^{-1}\cdot\text{s}^{-1}$  (SI unit) at a temperature  $T_1$  of between 15 and 30°C to a viscosity  $V_2$  which is greater than  $V_1$  by a factor of between 2 and 100 at a temperature  $T_2$  of the order of 40°C or higher and comprises between 0.1 g/100 ml and 5 g/100 ml of copolymers possessing

- an average molecular mass greater than 500 000 or a number of atoms along the main skeleton greater than 7 000,
- a fraction by mass of segments with LCST of between 2% and 15%, and

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- an average molecular mass of the segments with LCST greater than 4 000 or an average number of atoms along a segment with LCST greater than 90.

--52. (new) The medium according to Claim 32, wherein the said copolymer is present in the said medium and the copolymer concentration is less than 20 g/100 ml, and preferably between 0.1 g/100 ml and 8 g/100 ml.

--53. The medium according to Claim 32, which comprises, in addition, adjuvants of the type including particles, water-soluble polymers, nonthermothickening associative polymers, or surfactants, which may be neutral or ionic.

--54. (new) An use of a medium according to Claim 32, for the separation or analysis of species chosen from molecular or macromolecular species, and in particular biological macromolecules such as nucleic acids (DNA, RNA, oligonucleotides), nucleic acid analogues obtained by chemical synthesis or modification, proteins, polypeptides, glycopeptides and polysaccharides, organic molecules, synthetic macromolecules or particles such as mineral particles, latex, cells or organelles.

--55. (new) An use of a medium according to Claim 32, for the sequencing of DNA.

--56. (new) The use according to Claim 55, involving the use of a medium which transits from a viscosity  $V_1$  of between 50 and 1 000 mPa.m<sup>-1</sup>.s<sup>-1</sup> (SI unit) at a temperature  $T_1$  of between 15 and 30°C to a viscosity  $V_2$  which is greater than  $V_1$  by a factor of between 2 and 50 at a temperature  $T_2$  of the order of 40°C or higher and comprises between 5 g/100 ml and 20 g/100 ml of copolymers possessing

- an average molecular mass of between 30 000 and 2 000 000 or a number of atoms along the main skeleton of between 1 000 and 60 000,
- a fraction by mass of segments with LCST of between 2% and 20%, and
- an average molecular mass of the segments with LCST of between 2 000 and 20 000 or an average number of atoms along a segment with LCST of between 35 and 350,

to separate molecules having a molecular mass of less than 50 000 or oligonucleotides comprising less than 100 nucleotides, or else native or denatured proteins.